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TRANSACTIONS
OF THE
AMERICAN PHILOSOPHICAL SOCIETY,
HELD AT PHILADELPHIA,
FOR PROMOTING USEFUL KNOWLEDGE.

VOL. XV.—NEW SERIES.

PART III.

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VOL. XV.—NEW SERIES.

PUBLISHED BY THE SOCIETY.

Philadelphia:
M'CALLA & STAVELY, PRINTERS.
JANUARY 1,
1881.

EXTRACT

FROM THE LAWS OF THE SOCIETY RELATING TO THE TRANSACTIONS.

1. Every communication to the Society which may be considered as intended for a place in the Transactions, shall immediately be referred to a committee to consider and report thereon.
2. If the committee shall report in favor of publishing the communication, they shall make such corrections therein as they may judge necessary to fit it for the press; or, if they shall judge the publication of an abstract or extracts from the paper to be more eligible, they shall accompany their report with such abstract or extracts. But if the author do not approve of the corrections, abstract, or extracts reported by the committee, he shall be at liberty to withdraw his paper.
3. Communications not intended by their authors for publication in the Transactions, will be received by the Society, and the title or subject of them recorded ; and, if they be in writing, they shall be filed by the secretaries.
4. The Transactions shall be published in numbers, at as short intervals as practicable, under the direction of the Committee of Publication, and in such a form as the Society shall from time to time direct; and every communication ordered to be published in the Transactions shall be immediately sent to the printer, and fifty copies thereof be given to the author as soon as printed.
5. The order in which papers are read shall determine their places in the Transactions, unless otherwise ordered by the Society ; priority of date giving priority of location.
6. The expenses of publishing the Transactions shall be defrayed by subscriptions and sales, aided by such funds as the Society shall from time to time appropriate for that purpose.

COMMITTEE OF PUBLICATION 1880.

DR. JOHN L. LECONTE,
DR. DANIEL G. BRINTON,
PROF. ELIHU THOMSON,
DR. CHARLES M. CRESSON,
DR. GEORGE H. HORN.

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OFFICERS
OF THE
AMERICAN PHILOSOPHICAL SOCIETY,
FOR THE YEAR 1880.

PRESIDENT,	Frederick Fraley,	Address 2017 Delancey Place.	
VICE-PRESIDENTS,	{ Eli K. Price, E. Otis Kendall, John L. LeConte,	" 415 S. 15th Street. " 3836 Locust Street. " 1625 Spruce Street.	
SECRETARIES,	{ Pliny E. Chase, George F. Barker, Daniel G. Brinton, J. Peter Lesley,	" Haverford College. " 3909 Locust Street. " 7th and Sansom Sts. " 1008 Clinton Street.	
CURATORS,	{ Hector Tyndale, Charles M. Cresson, Henry Phillips, Jr.,	Died March 19, 1880. " 417 Walnut Street. " 304 S. 11th Street.	
TREASURER,	J. Sergeant Price,	" 709 Walnut Street.	
COUNCILLORS, elected	{ in 1878, in 1879, in 1880,	{ Daniel R. Goodwin, W. S. W. Ruschenberger, Henry Winsor, Wm. A. Ingham, { Alfred L. Elwyn, Benjamin H. Coates, Benjamin V. Marsh, George H. Horn, { Robert E. Rogers, Robert Bridges, Oswald Seidensticker, Richard Wood,	{ 8919 Locust Street. 1932 Chestnut Street. Pine Street Wharf. 16th and Pine Sts. " 1422 Walnut Street. " 7th and Spruce Sts. " 309 Market Street. " 874 N. 4th Street. " 1004 Walnut Street. " 119 S. 20th Street. " 1016 Cherry Street. " 1121 Arch Street.

LIST OF MEMBERS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY,

ELECTED SINCE THE PUBLICATION OF THE FOURTEENTH VOLUME.

Elected January 19, 1872.

- 1689. Wm. C. Kerr, Raleigh, N. C.
- 1690. LaMotte Dupont, Wilmington, Delaware.
- 1691. Wm. P. Trowbridge, New Haven, Conn.
- 1692. Wm. Elder, M.D., Philadelphia.
- 1693. Francis Bowyer Miller, Melbourne, Australia.
- 1694. Guillaume Lambert, Louvain, Belgium.
- 1695. Persifor Frazer, Jr., Philadelphia.
- 1696. George W. Hough, Albany, N. Y.
- 1697. Wm. A. Stokes, Philadelphia. Died May, 1877.
- 1698. Edwin J. Houston, Philadelphia.

Elected April 19, 1872.

- 1699. Jean Baptiste Léon Say, Paris, France.
- 1700. Lorin Blodget, Philadelphia.
- 1701. D. Hayes Agnew, M.D., Philadelphia.
- 1702. Adolph E. Borie, Philadelphia. Died February 5, 1880, æt. 70.

Elected July 19, 1872.

- 1703. Starr Hoyt Nichols, Philadelphia.
- 1704. Coleman Sellers, Philadelphia.
- 1705. Robert Peter, M.D., Lexington, Kentucky.
- 1706. Richard J. Levis, M.D., Philadelphia.

Elected October 18, 1872.

- 1707. Alexander Johnston Cassatt, Philadelphia.
- 1708. Clarence King, New York City.
- 1709. Horatio Hale, Clinton, Canada.
- 1710. Dr. Paul Broca, Paris, France. Died July 10, 1880.
- 1711. Franz Joseph Lauth, Munich, Bavaria.
- 1712. Isaac Norris, Jr., M.D., Philadelphia.

Elected January 17, 1873.

- 1713. Henry W. Acland, M.D., Oxford, England.
- 1714. George Borrow, M.D., London, England.
- 1715. James E. Oliver, Ithaca, N. Y.
- 1716. Robert P. Frazer, Philadelphia. Died May 1878, æt. 59.
- 1717. Thomas Clark, Philadelphia.
- 1718. Peter F. Rothermel, Philadelphia. (Present address Limerick P. O., Pa.)
- 1719. Joseph Zentmeyer, Philadelphia.
- 1720. A. H. Spofford, Washington, D. C.
- 1721. C. Percy LaRoche, M.D., Philadelphia.
- 1722. Henry Pemberton, Philadelphia.

Elected April 18, 1873.

- 1723. Sir William Thomson, F.R.S., London. (Present address Glasgow.)
- 1724. Alfred R. Wallace, Croydon, England.
- 1725. Philip Lutley Sclater, London.
- 1726. Sir Henry Thompson, M.B., London.
- 1727. Edouard Dupont, Brussels, Belgium.
- 1728. Baron Selys de Longchamps, Liège, Belgium.
- 1729. Théodore M. Gougain, Bayeux, Calvados, France.
- 1730. Henri De Saussure, Geneva, Switzerland.
- 1731. Giovanni Capellini, Bologna, Italy.
- 1732. Giovanni Battista Rossi, Rome, Italy.
- 1733. Luigi Palmieri, Naples, Italy.
- 1734. Heinrich Helmholtz, Berlin, Germany.
- 1735. Theodor Mommsen, Berlin, Germany.
- 1736. Theodore D. Rand, Philadelphia.

1737. Joseph LeConte, Oakland, Cal. (Present address
Berkeley, Cal.)

1738. John LeConte, Oakland, Cal. (Present address
Berkeley, Cal.)

1739. John Fulton, Johnstown, Pa.

1740. Lloyd P. Smith, Philadelphia. Resigned Jan. 25,
1875.

1741. George F. Barker, Philadelphia.
Elected October 17, 1873.

1742. A. Loudon Snowden, Philadelphia.

1743. John S. Haines, Germantown, Pa.

1744. Matthew Huizinga Messchert, Douglassville, Pa.

1745. J. Blodget Britton, Philadelphia.

1746. John Walter Harden, Philadelphia. Died Nov. 8,
1870, æt. 63.
Elected January 16, 1874.

1747. Joseph Miller Wilson, Philadelphia.

1748. William H. Wahl, M.D., Philadelphia.

1749. Increase Allen Lapham, Milwaukee, Wis. Died
September 14, 1875, æt. 65.

1750. Dr. Hermann Kolbe, Leipsig, Saxony.

1751. J. E. Wootten, Reading, Pa.
Elected April 17, 1874.

1752. William Camac, Philadelphia.

1753.

1754. Frank Thomson, Altoona, Pa. (Present address
Philadelphia.)

1755. Rev. Robert Ellis Thompson, Philadelphia.

1756. Joseph Norman Lockyer, London.

1757. Richard A. Proctor, England.

1758. Raphael Pumpelly, Newburgh, N. Y. (Present
address Newport, R. I.)

1759. Charles Augustus Young, Princeton, N. J.
Elected July 17, 1874.

1760. Franklin Platt, Philadelphia, Pa.

1761. Sir William George Armstrong, Newcastle-on-
Tyne, England.

1762. Henry Woodward, London, England.
Elected October 16, 1874.

1763. Rev. James Freeman Clarke, Boston, Mass.

1764. Franz Ritter Von Hauer, Vienna, Austria.

1765. Rawson W. Rawson, Barbadoes.

1766. Samuel Philip Sadtler, Philadelphia.

1767. George A. König, Philadelphia.

1768. Charles Francis Himes, Carlisle, Pa.

1769. Robert Stockton Kenderdine, M.D., Philadelphia.

1770. Alfred R. C. Selwyn, Montreal, Canada.

Elected January 15, 1875.

1771. Jared P. Kirtland, M.D., East Rockport P. O., Ohio.
Died December 10, 1877, æt. 84.

1772. John B. Pearse, Philadelphia. (Present address
Boston.)

Elected April 16, 1875.

1773. William A. Ingham, Philadelphia.

1774. Viollet le Duc, France. Died.

1775. John McArthur, Jr., Philadelphia.

1776. Joseph Allison, Philadelphia.

1777. Edward Penington, Philadelphia.

1778. Henry Cadwalader Chapman, M.D., Philadelphia.

1779. Alexander Agassiz, Cambridge, Mass.

1780. Frederick Prime, Jr., Easton, Pa. (Present address
Baltimore, Md.)

1781. Samuel P. Langley, Allegheny City, Pa.

1782. Henry S. Hagert, Philadelphia.

1783. C. F. Chandler, New York City.

1784. Rossiter W. Raymond, New York City.

1785. Leonard G. Frank, Philadelphia. Died May (?), 1876.

1786. William P. Tatham, Philadelphia.
Elected July 16, 1875.

1787. Thomas Messinger Drown, M.D., Easton, Pa.

1788. John Lyle Campbell, Crawfordsville, Indiana.
Elected October 15, 1875.

1789. Stephen Smith, M.D., New York City.

1790. William Blasius, Philadelphia.

1791. Gideon E. Moore, Jersey City, N. J.

1792. Furman Sheppard, Philadelphia.

1793. Russell Thayer, Philadelphia.

1794. James Clerk Maxwell, Cambridge, England. Died
November 4, 1879, æt. 47.

1795. Charles Edward Hall, Philadelphia.

1796. John Franklin Carl, Pleasantville, Pa.

1797. Andrew Sherwood, Mansfield, Pa.
Elected January 21, 1876.

1798. J. Gibbons Hunt, Philadelphia. Resigned Novem-
ber 17, 1876.

Elected April 21, 1876.

1799. Frank M. Etting, Philadelphia.

1800. Daniel C. Gilman, Baltimore, Md.

1801. P. Cunliff Owen, London, England.

1802. I. Lowthian Bell, Newcastle-on-Tyne, England.

1803. James Geikie, Edinburgh, Scotland.

1804. Thomas C. Archer, Edinburgh, Scotland.

1805. Adolf Eric Nordenstkiold, Stockholm, Sweden.

1806. C. Juhlin Dannefeld, Stockholm, Sweden.

1807. Elihu Thompson, Philadelphia.

1808. Charles V. Riley, St. Louis, Mo.

Elected July 21, 1876.

1809. Richard Åkerman, Stockholm.

1810. John Johnson, Middletown, Conn.

Elected October 20, 1876.

1811. Samuel Davenport, Adelaide, S. Australia.

1812. Dom Pedro D'Alcantara, Emperor of Brazil, Rio da Janeiro.

1813. John F. Hartranft, Philadelphia.

1814. W. Milnor Roberts, New York City.

1815. Augustus Radcliffe Grote, Buffalo, N. Y.

Elected February 2, 1877.

1816. F. Reuleaux, Berlin, Germany.

1817. Rudolf Von Wagner, Würzburg, Germany.

1818. Mariano Barcena, Mexico.

1819. E. H. Von Baumhauer, Harlem, Holland.

1820. George Stuart, Philadelphia.

1821. William V. McKean, Philadelphia.

1822. Charles W. Shields, Princeton, N. J.

1823. Franklin B. Gowan, Philadelphia.

1824. Henry Phillips, Jr., Philadelphia.

1825. Henry Turner Eddy, Cincinnati, Ohio.

1826. Cyrus Fogg Brackett, M.D., Princeton, N. J.

1827. James Morgan Hart, Cincinnati, Ohio.

1828. Henry Armitt Brown, Philadelphia. Died August 24, 1878, æt. 33.

1829. Charles William Siemens, London, England.

1830. M. Russell Thayer, Philadelphia.

1831. Craig Biddle, Philadelphia.

1832. Thomas Hewson Bache, M.D., Philadelphia.

1833. John Hugh McQuilian, M.D., Philadelphia. Died March 3, 1879, æt. 53.

1834. George Strawbridge, M.D., Philadelphia.

1835. William Goodell, M.D., Philadelphia.

1836. Thomas Frederick Crane, Ithaca, N. Y.

Elected April 20, 1877.

1837. Henry Draper, M.D., New York City.

1838. J. T. Rothrock, M.D., Philadelphia.

1839. James Douglas, Phoenixville, Pa.

1840. John James Stevenson, New York City.

1841. George R. Moorehouse, M.D., Philadelphia.

1842. T. B. Reed, M.D., Philadelphia.

Elected July 20, 1877.

1843. H. C. Humphreys, Philadelphia.

1844. J. J. Sylvester, Baltimore, Md.

1845. John Ericsson, New York City.

Elected October 19, 1877.

1846. William B. Taylor, Washington.

Elected January 18, 1878.

1847. Ira Franklin Mansfield, Cannelton, Pa.

1848. I. C. White, Morgantown, W. Va.

1849. F. A. Randall, M.D., Warren, Pa.

1850. John Price Wetherill, Philadelphia.

1851. Elisha Gray, Chicago, Ill.

1852. Simon Newcomb, Washington, D. C.

1853. Asaph Hall, Washington, D. C.

1854. Theodore G. Wormley, M.D., Philadelphia.

1855. Christian Henry Frederick Peters, Clinton, N. Y.

1856. James F. Watson, Ann Arbor, Mich. Died Nov. 23, 1880, æt. 41.

1857. Francis Andrew March, Easton, Pa.

1858. Burnet Landreth, Bristol, Pa.

Elected May 3, 1878.

1859. C. Newlin Pierce, DDS., Philadelphia.

1860. Robert Henry Alison, M.D., Philadelphia.

1861. William D. Marks, Philadelphia.

1862. Lewis M. Haupt, Philadelphia.

1863. Burt Green Wilder, M.D., Ithaca, N. Y.

Elected September 20, 1878.

1864. Carl Schurz, Washington, D. C.

1865. Jacob B. Knight, Philadelphia. Died March 10, 1879, æt. 48.

1866. Rev. Fred. Augustus Muhlenberg, Philadelphia.

1867. Elliott Coues, M.D., U.S.A., Washington, D. C.

1868. Alpheus Spring Packard, Jr., M.D., Salem, Mass. (Present address Providence, R. I.)

1869. Joel Asaph Allen, Cambridge, Mass.

1870. Samuel Hubbard Scudder, Cambridge, Mass.

1871. Rev. William Rudder, Philadelphia. Died Jan. 29, 1880.

1872. Morris Longstreth, M.D., Philadelphia.

Elected October 18, 1878.

1873. Albert H. Smith, M.D., Philadelphia.

1874. Rev. Samuel Longfellow, Germantown (Phila.).

1875. Rev. Edward Abraham Foggo, Philadelphia.

1876. M. A. Descloizeaux, Paris, France.

1877. C. Schorlemmer, Manchester, England.

Elected January 17, 1879.

1878. Charles Benjamin Dudley, Altoona, Pa.

1879. Philip Howard Law, Philadelphia.

Elected April 18, 1879.

1880. William H. Greene, M.D., Philadelphia.

1881. Arthur Erwin Brown, Philadelphia.

1882. Middleton Goldsmith, M.D., Rutland, Vt.

1883. Carl Seiler, M.D., Philadelphia.
1884. Richard Wood, Philadelphia.
Elected July 18, 1879.
1885. Charles Martins, Montpellier, France.
1886. Sir George Biddle Airy, Greenwich, England.
1887. Charles M. Wheatley, Phoenixville, Pa.
1888. Andrew S. McCreath, Harrisburg, Pa.
1889. Ira Remsen, Baltimore, Md.
1890. E. Reneviers, Lausanne, Switzerland.
1891. Benjamin B. Comegys, Philadelphia.
Elected January 16, 1880.
1892. Damiano Muoni, Milan, Italy.
1893. Charles Francis Adams, Boston, Mass.
1894. Henry Wharton, Philadelphia.
1895. Charles A. Ashburner, Philadelphia.
1896. Robert C. Winthrop, Boston, Mass.
1897. Archibald Geikie, Edinburgh, Scotland.
1898. Oliver Wendell Holmes, M.D., Boston, Mass.
1899. George Whitney, Philadelphia.
Elected April 16, 1880.
1900. Austin Flint, M.D., New York.
1901. Austin Flint, Jr., M.D., New York.
1902. Robert Bartholow, M.D., Philadelphia.
1903. John Vaughan Merrick, Philadelphia.
1904. Ellis Yarnall, of Philadelphia.
1905. George Dana Boardman, D.D., Philadelphia.
1906. Wm. B. Rogers, Sr., Philadelphia.
1907. Ogden N. Road, New York.
1908. Henry Martin Chance, Philadelphia.
1909. Wm. Thomson, M.D., Philadelphia.
1910. Carlisle P. Patterson, Supt. U. S. C. Survey.
1911. Hampton L. Carson, Philadelphia.
1912. Joseph C. Fraley, Philadelphia.
1913. Joseph A. Murray, D.D., Carlisle, Pa.
1914. Horace Howard Furness, Philadelphia.
Elected October 15, 1880.
1915. Alvan Clark, Cambridgeport, Mass.
1916. Alex. C. Outerbridge, U. S. Mint.
1917. Jacob B. Eckfeldt, U. S. Mint.
1918. Patterson Dubois, U. S. Mint.
1919. Lewis A. Scott, Philadelphia.
1920. Cadwalader Biddle, Philadelphia.
1921. Thomas H. Dudley, Camden, N. J.
1922. Isaac C. Martindale, Camden, N. J.
1923. Wm. Boyd Dawkins, Manchester, England.
1924. Daniel Draper, Ph.D., New York.

LIST OF MEMBERS

REPORTED DECEASED OR RESIGNED

SINCE THE PUBLICATION OF THE FOURTEENTH VOLUME.

Reported in 1871-2.

J. Bell, of Philadelphia.
Franz Bopp, of Berlin.
R. J. Breckinridge, of Danville, Kentucky.
J. P. Brown, of Constantinople.
Dr. Bujalsky, of St. Petersburg.
S. H. Dickson, of Philadelphia.
C. Dworjak, of St. Petersburg.
J. R. Eckfeldt, of the U. S. Mint, Philadelphia.
Felice Finzi.
J. F. Frazer, of the University of Pennsylvania.
Count A. de Gasparin, of Paris.
W. W. Gerhard, M.D., of Philadelphia.
C. Guillou, of Philadelphia.
S. L. Hollingsworth, of Philadelphia.
R. Ingersoll, of Philadelphia.
S. Jackson, M.D., of Philadelphia.
Alex. Kasim Beg, of St. Petersburg.
René La Roche, M.D., of Philadelphia.
G. G. Meade, U. S. Army.
E. Miller, C. E., of Philadelphia.
E. Morris, C. E., of Philadelphia.
S. F. B. Morse, of New York.
Christian Olrick, of Denmark.
Pictet de la Rive, of Geneva.
Maria Somerville, of England.
T. Sully, of Philadelphia.

Reported in 1873.

L. J. R. Agassiz, of Cambridge, Mass.
Elias Durand, of Philadelphia.
Joshua Francis Fisher, of Philadelphia.
Hugh L. Hodge, of Philadelphia.
Sir Henry Holland, of London.

Edward King, of Philadelphia.
Justus Von Liebig, of Munich.
Thomas McEuen, of Philadelphia.
William M. Meredith, of Philadelphia.
John Stuart Mill, of London.
F. A. Pouchet, of Rouen.
Frederick Von Raumer, of Berlin.
Joseph Saxton, of Philadelphia.
George C. Schaeffer, of Washington, D. C.
William S. Sullivant, of Columbus.
Adam Sedgwick, of England.
John Torrey, of New York.
F. C. Zantedeschi, of Padua.

Reported in 1874-75.

L. Elie de Beaumont, of Paris.
Horace Binney, of Philadelphia.
N. B. Brown, of Philadelphia.
D. F. Condie, of Philadelphia.
G. Emerson, of Philadelphia.
K. Goddard, of Philadelphia.
S. J. Gummere, of Haverford College, Penna.
Jos. Harrison, of Philadelphia.
A. A. Henderson, of the U. S. Navy.
F. Kiernan, of London.
J. A. Lapham, of Milwaukee, Wis.
W. E. Logan, of Montreal.
Charles Lyell, of London.
C. F. Naumann, of Leipsig.
G. W. Norris, of Philadelphia.
J. Phillips, of Oxford.
Wm. Proctor, of Philadelphia.
M. C. Quetelet, of Brussels.
John M. Read, of Philadelphia.

Nat. Shurtleff, of Boston.
 Charles Sumner, of Washington.
 J. H. Towne, of Philadelphia.
 C. B. Trego, of Philadelphia.
 W. E. Whitman, of Philadelphia.
 Jeffries Wyman, of Cambridge, Mass.

Reported in 1876-77.

George Allen, of Philadelphia.
 H. J. Anderson, of New York.
 C. W. Böckh, Christiania, Norway.
 Alex. Braun, of Leipsig.
 J. Carson, of Philadelphia.
 W. T. A. Conrad, of Philadelphia.
 T. Cuyler, of Philadelphia.
 J. C. Cresson, of Philadelphia.
 C. H. Davis, of U. S. Navy.
 C. DesMoulins, of Bordeaux.
 Robert Wise Fox.
 J. Hakakian Bey, of Cairo.
 John S. Hart, of Philadelphia.
 J. Hughes.
 Wm. Jardine, of Scotland.
 J. J. Kaup, of Darmstadt.
 U. J. J. Le Verrier, of Paris.
 Elias J. Lewis, of Philadelphia.
 W. A. Lowrie, of Philadelphia.
 F. B. Meek, of Washington.
 Edmund Quincy, of Dedham, Mass.
 R. S. Smith, of Philadelphia.
 W. A. Stokes, of Philadelphia.
 Louis Stromeyer, of Hanover.
 Fred. Aug. Tholuck, of Halle.

Reported in 1878.

Thos. F. Betton, of Philadelphia.
 Henry Armitt Brown, of Philadelphia.
 Marcus Bull, of Philadelphia.
 Robert Frazer, of Philadelphia.
 Wm. M. Gabb, of Philadelphia.
 Wm. H. Grinnell, of New York.
 Benjamin Hallowell, of Alexandria, Va.
 Joseph Henry, of Washington.

Jared P. Kirtland, of Ohio.
 Lord Mahon, of England.
 Henry Victor Regnault, of Paris.
 Paolo Angelo Secchi, of Rome.
 Theo. Strong, of New York.
 Jos. G. Swift, U. S. Army.

Reported in 1879-80.

E. B. Andrews, of Ohio.
 E. R. Beadle, of Philadelphia.
 John B. Biddle, of Philadelphia.
 Jacob Bigelow, of Boston.
 Adolph E. Borie, of Philadelphia.
 Paul Broca, of Paris.
 John Cadwalader, of Philadelphia.
 Henry C. Carey, of Philadelphia.
 Michel Chevalier, of Paris.
 Viollet le Duc, of Paris.
 Clement A. Finley, of Philadelphia.
 John Walter Harden, of Philadelphia.
 S. S. Haldeman, of Chicques, Pa.
 Isaac Hays, of Philadelphia.
 Jacob B. Knight, of Philadelphia.
 Hermann Lebert, of Breslau.
 James Lenox, of New York.
 Elia Lombardini, of Milan.
 James Clark Maxwell, of Cambridge, England.
 Peter McCall, of Philadelphia.
 Morton McMichael, of Philadelphia.
 J. H. McQuillen, of Philadelphia.
 E. Spencer Miller, of Philadelphia.
 John Neill, of Philadelphia.
 Benjamin Pierce, of Cambridge, Mass.
 Carl Fried. Roketanski, of Vienna.
 Wm. Rudder, of Philadelphia.
 Paolo Volpicelli, of Rome.
 Jas. P. Watson, of Michigan.
 Henry J. Williams, of Philadelphia.
 George B. Wood, of Philadelphia.
 Henry Wharton, of Philadelphia.
 Alexander Wilcocks, of Philadelphia.
 Johannes Rudolf Von Wagner, of Würzburg.